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PATENT ABSTRACTS OF JAPAN

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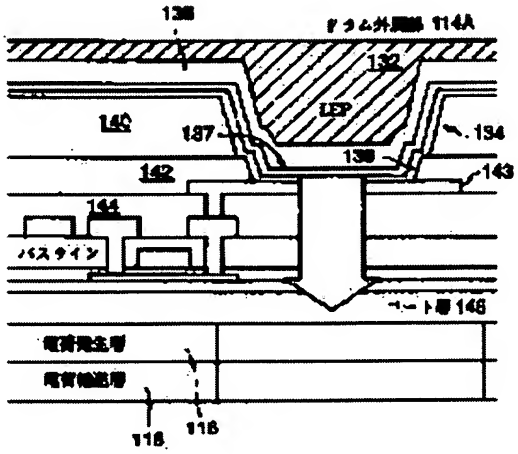
(54) DIGITAL PRINTER

(57)Abstract:
PROBLEM TO BE SOLVED: To eliminate main scanning or the like operation as a light source in an internal image exposure system, and remarkably improve registration of colors.
SOLUTION: The digital printer has an EL pixel array 134 attached to an entire circumferential face of a photosensitive drum, thereby constituting an internal light source. Pixels controllable by a TFT layer 144 are allotted to the whole of an image formation area of the photosensitive drum. A mechanism for moving the light source in a main scanning direction as in a conventional internal light source using an LED is eliminated, and factors causing a deviation of image positions of colors are totally eliminated. Full color images of a high- quality can be obtained without a color shift or the like at all.



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[Date of final disposal for application]

[Patent number]

[Date of registration]

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[Date of requesting appeal against examiner's decision of rejection]

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JAPANESE [JP,2001-018441,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

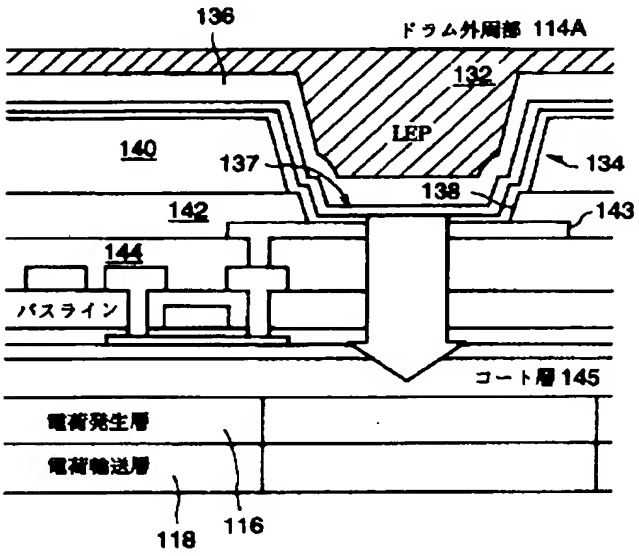
* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1] The base layer which consists of a fluorescent substance layer and a charge control layer, and the electrode layer put on one field of the aforementioned base layer, The circuit section which controls luminescence of a fluorescent substance by impressing predetermined voltage between the aforementioned electrode layers, And the TFT layer which put on the field of another side of the aforementioned base layer, divided the aforementioned base layer, was made to produce the potential difference independently between the aforementioned electrode layers for every division field, and was equipped with two or more pixel sections which can luminescence control the fluorescent substance in the aforementioned base layer, The digital printer which applied EL pixel array come out of and formed as the light source for latent-image exposure.
[Claim 2] The live part for the digital printer of a publication being charged in the periphery of a photo conductor drum and the aforementioned photo conductor drum in the aforementioned claim 1, It has the pressurization member pressed by the development section which develops the electrostatic latent image formed in the aforementioned live part, and the periphery of the aforementioned photoconductor drum with predetermined nip pressure. the imprint section which imprints the picture which was made to convey, pinching imprint material between the peripheries of the aforementioned photoconductor drum, and was developed in the development section, the fixing section for being prepared in the imprint subordinate style side in the conveyance way of the aforementioned imprint material, and a transfer picture being established, and the digital printer characterized by being come out and constituted
[Claim 3] The aforementioned development section is prepared for every predetermined pitch for two or more colors of every, and a live part is prepared in an upstream for two or more of these development sections of every, respectively. Electrification for every color, picture exposure of the predetermined hoop-direction width-of-face unit corresponding to a pitch predetermined [aforementioned] to under 1 rotation of the aforementioned photoconductor drum, And the digital printer according to claim 2 characterized by what is imprinted to the aforementioned imprint material after development is repeated and two or more color pictures pile up on the aforementioned photoconductor drum.

[Translation done.]

Drawing selection [Representativ drawing]



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JAPANESE [JP,2001-018441,A]

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[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the electronic printer which used EL display objects, such as organic and an inorganic EL panel.
[0002]
[Description of the Prior Art] After repeating electrification, image exposure, and reversal development and piling up a direct color toner image on a photo conductor on a photo conductor in recent years, the color picture formation method which carries out a package imprint to imprint material is learned (KNC process).
[0003] This process feature is to perform subtractive color mixture which piles up a direct toner image on a photo conductor, and will develop negatives by forming the following latent image from on a toner image. It is possible to perform image exposure from the exterior and the interior of a photo conductor.
[0004] In order to form a color picture, the subtractive color color mixture which piles up a toner image is required. By the external image exposure method, since a toner image is already on a photo conductor, restrictions arise on image exposure wavelength.
[0005] On the other hand, by the method (internal image exposure) of performing image exposure of two amorous glance from the interior of a photo conductor, since it has the feature which can form a latent image, without being influenced by the toner layer on a photo conductor of optical cover, the grade of a color correction mitigates only amendment of toner layer potential sharply.
[0006] As a photo conductor of an internal image exposure method, standard usage considers as a drum configuration, and alignment and a Light Emitting Diode head with an easy miniaturization are more common than a laser beam study system as optical system. The diameter of a drum can carry out [minor diameter]-izing 30 to 40% compared with an external image exposure method. Moreover, in order to carry out image exposure from the interior of a drum by the Light Emitting Diode unit arranged inside a transparent drum, the superposition of alignment precision and a toner image improves.
[0007] Thus, by the internal image exposure method, alignment precision and a color pile can realize the small and high-speed color printer improved theoretically with combination with the Light Emitting Diode head which is small optical system.
[0008] Moreover, a one-revolution copy method has few dust of the toner image which poses a problem by the imprint method, and gaps, and it also has an advantage, like there are no restrictions of being suitable for whether it is high definition and a transfer paper.
[0009]
[The technical problem for invention being solved] However, when a Light Emitting Diode unit is used as the light source, the light from a Light Emitting Diode unit is condensed, and it is necessary to perform horizontal scanning (shaft-orientations movement of a drum). Moreover, if

compared with an external image exposure method, although alignment precision will be improved, the beginning timing of each color is dependent on the rotational-speed precision of a drum. Moreover, although there is also a method which uses a Light Emitting Diode unit as the line light source, and excludes horizontal scanning, the precision of the array of the Light Emitting Diode point light source is as low as about **50 micrometers, is still ruder, and unsuitable for a highly precise printer. [of a pitch]

[0010] it is the purpose to obtain the digital printer which operation of horizontal scanning etc. of this invention is [a digital printer] unnecessary as the light source in an internal image exposure method, it can boil the alignment of each color markedly in consideration of the above-mentioned fact, and can improve

[0011]

[Means for Solving the Problem] The conductive electrode layer which this invention put on one field of a fluorescent substance layer, the base layer formed from a charge control layer, and the aforementioned base layer, The circuit section which controls luminescence of a fluorescent substance by impressing predetermined voltage between the aforementioned electrode layers, And put on the field of another side of the aforementioned base layer, and the aforementioned base layer is divided. The TFT (Thin-Film-Transistor) layer which was made to produce the potential difference independently between the aforementioned electrode layers for every division field, and was equipped with two or more pixel sections which can luminescence control the fluorescent substance of the aforementioned base layer, It is the digital printer which applied EL (Electro-Luminescent) pixel array come out of and formed as the light source for latent-image exposure.

[0012] Moreover, the live part for the aforementioned digital printer being charged in the periphery of a photo conductor drum and the aforementioned photo conductor drum, It has the pressurization member pressed by the development section which develops the electrostatic latent image formed in the aforementioned live part, and the periphery of the aforementioned photoconductor drum with predetermined nip pressure. it is made to convey, pinching imprint material between the peripheries of the aforementioned photoconductor drum, and it comes out with the imprint section which imprints the picture developed in the development section, and the fixing section for being prepared in the imprint subordinate style side in the conveyance way of the aforementioned imprint material, and a transfer picture being established, and is constituted

[0013] In the above-mentioned digital printer, the aforementioned development section is prepared for every predetermined pitch for two or more colors of every. A live part is prepared in an upstream for two or more of these development sections of every, respectively. during 1 rotation of the aforementioned photoconductor drum Electrification for every color, picture exposure of the predetermined hoop-direction width-of-face unit corresponding to the aforementioned predetermined pitch, and development are repeated, and two or more color pictures pile up on the aforementioned photoconductor drum, and are imprinted the back to the aforementioned imprint material.

[0014] Since the pixel array used as the light source is prepared in the drum perimeter and its relative position of the position of each pixel and the position of a drum peripheral surface always corresponds, it is only management of the pixel arranged in the shape of a matrix, and the picture position of two or more colors does not shift.

[0015] Furthermore, since it is in a drum perimeter, it can respond to all exposure methods, such as field exposur , scanning exposure, and slit exposure. In addition, whenever it forms the picture of predetermined hoop-direction width of face at once and the development of one color is completed, it is made to form the picture corresponding to the following color for every picture of this predetermined width of face in this invention. Consequently, two or more colors can be developed by drum 1 rotation, and the picture of two or more colors can put on drum lifting.

[0016] Since the piled-up picture is imprinted by imprint material, is fixed in the fixing section in the imprint section and is discharged, compared with the conventional many rotary systems and a tandem system, processing of one picture can be managed extremely in a short time.
[0017]
[Embodiments of the Invention] The internal image exposure formula digital printer 100 concerning the form of this operation is shown in drawing 1 .
[0018] The upper part of casing 102 is made into the engine section 104, and each part article required for image formation is attached. Moreover, the medium tray 106 is formed in the lower part of casing 102. The web material 108 is held in the medium tray 106. The sheet equipment which sends out at a time one web material 108 by which the laminating was carried out from the best layer and which is not illustrated is arranged in the upper part of this medium tray 106. thereby -- a web material 108 -- a conveyance roller pair -- it is the structure which pinching conveyance is carried out and is sent into 110 and 112 to the engine section 102
[0019] The photoconductor drum 114 is arranged in the engine section 102. This photoconductor drum 114 rotates by fixed speed in the direction of a clockwise rotation of drawing 1 .
[0020] The charge generating layer 116 and the charge transporting bed 118 (refer to drawing 2 , both detailed after-mentioned) are formed in the peripheral surface of a photoconductor drum 114 in layers, and can store a charge in it (electrification).
[0021] Around this photoconductor drum 114, two or more live parts 120 and development sections 122 of every color (CMYK) are arranged. in addition, the turn of arrangement -- the direction of a clockwise rotation of a photoconductor drum 114 -- meeting -- live-part 120for Y colors Y, development section 122Y for Y colors, and the object for M colors -- live-part 120M, development section 122M for M colors, live-part 120for C colors C, development section 122C for C colors, and the object for K colors -- it is live-part 120K and development section 122K for K colors At each live part 120, the front face of a photoconductor drum 114 is charged in plus, and the toner charged in minus is supplied in the development section 122. That is, in the field between the live part 120 of each color, and the development section 122, the latent image of each color is formed in a photoconductor drum 114 with the internal light source 124 mentioned later.
[0022] Moreover, it is conveyed by the imprint section 126 prepared in the lower part of drawing 1 of a photoconductor drum 114, the aforementioned web material 108 progresses along with the tangential direction of a photoconductor drum 114, and it is conveyed, being pressed by the photoconductor drum 114 by the predetermined pressure in the imprint section 126. In addition, at the time of this press, the seal of approval of the predetermined plus voltage for drawing near the toner by which minus electrification was carried out is carried out.
[0023] After an imprint in the aforementioned imprint section 126 is completed, by continuing rotation and passing the cleaner section 128, a peripheral surface is cleaned and a photoconductor drum 114 returns to the electrification position of the aforementioned beginning.
[0024] That is, with the form of this operation, the development of two or more colors required for a full color picture at one rotation of a photoconductor drum 114 and an imprint can be performed.
[0025] The web material 108 which passed the imprint section 126 is conveyed to the fixing section 130, fixes the toner imprinted by the heat of predetermined temperature, and the predetermined pressure, is discharged from the outside of casing 102, and is sent on the discharge tray 132.
[0026] Inside the charge generating layer 116 prepared in the peripheral surface of the aforementioned photoconductor drum 114, and the charge transporting bed 118, the aforementioned field-like internal light source array 124 is formed so that these layers may be met.

(Structure of the internal light source) A part of cross-section structures of the periphery of a photoconductor drum 114 are shown in drawing 2 .

[0027] EL pixel array 134 as an internal light source array 124 is wound around periphery section 114A of the main part of a drum through the adhesives layer 132, and it is stuck on it.

[0028] As for EL pixel array 134, the cathode electrode layer 136 (product made from an aluminum lithium alloy), the fluorescent substance layer 137, the electron hole (hole) transporting bed 138 (the photogene layer 137 and the electron hole transporting bed 138 are called base layer.), the layer insulation film 140, the adhesives layer 142 (SiO2), the anode plate electrode layer 143, and the TFT layer 144 are formed one by one from the aforementioned adhesives layer 132 side. After EL pixel array is stuck on the main part of a drum, the coat layer 145 is formed in the front face, the charge generating layer 116 and the charge transporting bed 118 are formed one by one, and a photoconductor drum 114 is done.

[0029] It is divided into pixel section 144P and circuit section 144C, pixel section 144P are divided in the shape of a matrix, and the TFT layer 144 is the aggregate which is the pixel which can luminescence control a fluorescent substance independently, as shown in drawing 3 and drawing 5 . Moreover, circuit section 144C is a driver for performing luminescence control of this pixel, and is arranged ranging over two sides (X driver section 144CX and Y driver section 144CY) which the TFT layer 144 adjoins. In addition, X driver section 144CX in circuit section 144C of the TFT layer 144 makes the simultaneously perimeter of a drum the field which can be charged by considering as the superposition bottom when EL display object 134 winds (refer to drawing 3). in addition, the piled-up portion has acquired the smooth field without a level difference by devising the layer structure of a pile, although a circumference level difference arises usually coming out Although there is almost no gap, as for the part of this joint, it is desirable to make a joint line into a drum rotation initial valve position.

[0030] In pixel section 144P of the TFT layer 144, circuit 144A shown in drawing 4 is crowded.

[0031] It is the line by which the scanning line 146 transmits the signal from Y driver section 144CY, and is the line by which a signal line 148 transmits the signal from X driver section 144CX, and a desired pixel can be made to emit light with predetermined gradation in this circuit 144A by choosing Coordinate x and the pixel which emits light based on y. The capacitor line 150 is a means for giving the reference potential of a capacitor, and the potential from a signal line is stored in a capacitor 151.

[0032] Here, each circuit 144A on pixel section 144P is controlled by circuit section 144C of the TFT layer 144 to be shown in drawing 5 . That is, the transistor 152 for a switch is turned on, signal potential is stored in a capacitor 151 and it makes the transistor 154 for a drive turn on. Thus, the potential difference arises between the anode plate on drive TFT 154, and the cathode electrode layer 136, and it has the structure where the fluorescent substance layer 137 currently pinched by this portion emits light. The electron hole transporting bed 138 is a layer for making the hole from an anode plate easy to inject into the EL layer 137. In addition, with the form of this operation, a coloring color is the light and gradation is expressed based on the voltage information from each signal line.

[0033] EL pixel array 134 in the form of the above-mentioned implementation is formed through the process indicated by the upper shell turn of drawing 6 . The order of a process serves as stratum disjunctum formation ->TFT element formation -> layer insulation film formation -> contact hole formation -> transparent-electrode layer formation -> bank formation -> hole transporting-bed formation ->EL layer formation -> electrode layer formation.

[0034] Stratum disjunctum is formed for example, by amorphous silicon:H, and by irradiating a laser beam, the portion exfoliates and it can remove EL pixel array from a pedestal. It is wound on the main part of a drum, and stripped-off EL pixel array 134 is stuck, as shown in drawing 3 . Then, the coat layer 145, the charge generating layer 116, and the charge transporting bed 118 are formed one by one, and become a photoconductor drum 114.

[0035] With the internal light source of the above-mentioned composition, since the pixel of the

regular position exists to the peripheral surface of a photoconductor drum 114, respectively, a latent image can be formed in the state where there is no position gap of the picture of two or more colors.

[0036] When the aforementioned initial valve position of a photoconductor drum 114 passes the cleaner section 128, rotating a photoconductor drum 114 by fixed speed, the order of formation of a latent image It is charged by live-part 120Y for the first colors (Y color), and a latent image is formed with the light from the internal light source 124 based on the picture signal for Y colors. After developing negatives by development section 122Y, it is charged in live-part 120M for the following color (M color), and performs rewriting a latent image to all colors based on th picture signal for M colors. Namely, electrification and development of each color can be simultaneously advanced now in the middle of image formation.

[0037] An operation of the form of this operation is explained below.

[0038] If there are print directions, first, a photoconductor drum 114 is rotated, and when an initial valve position 134, i.e., EL display object, is made to go around, the joint section of the edge which laps with X driver section 144CX will detect the time which passed the cleaner section 128.

[0039] From this time, a clock is started and electrification of each color, latent-image formation (EL luminescence), and development (toner supply) are started in a timing ty second, tm second, tc second, and tk second. This timing ty second, tm second, tc second, and tk second are decided by the movement magnitude from the aforementioned initial valve position to the live part 120 of each color, and linear velocity of a photoconductor drum 114, and, in the case of pitches [live part / each / 120], each time interval difference alpha becomes equal. Namely, after passing an initial valve position, electrification of live-part 120y is started in ty second. Electrification of live-part 120M is started after fixed time alpha progress (since an initial valve position is passed after tm). Furthermore, electrification of live-part 120C is started after fixed time alpha progress (since an initial valve position is passed after tc second), and electrification of live-part 120K is further started after fixed time alpha progress (since an initial valve position is passed after tk second).

[0040] Synchronizing with the initial valve position of a photoconductor drum 114 passing the imprint section 126, a web material 108 is carried out from a medium tray 106, and a point enters to the imprint section 126. For this reason, the toner of each color piles up with the picture field of the photoconductor drum 114 which adhered in piles, and is pinched by the predetermined pressure. At this time, in the imprint section 126, the potential of plus has arisen and it is easy to imprint the toner charged in minus to a web material 108. Thereby, a toner is certainly imprinted by the web material 108.

[0041] A web material 108 is conveyed to the fixing section 130 of the following process, and after fixing processing is carried out, it is discharged to the discharge tray 132. Moreover, an initial valve position results to the cleaner section 128, and, as for the photo conductor drum 114, it waits for the next print directions.

[0042] Since according to the form of this operation EL pixel array 134 was used as the interior light source 124 of attachment over the perimeter and the pixel controllable by the TFT layer 144 was assigned to all the image formation fields of a photoconductor drum 114 in accordance with the peripheral surface of a photoconductor drum 114, the mechanism moved to main scanning direction becomes unnecessary like the internal light source using the conventional Light Emitting Diode, and the element with which the picture position for every color shifts is completely lost. For this reason, in a full color picture, there is no color gap etc. and a high-definition picture can be acquired.

[0043] Moreover, according to the abov -mentioned image formation control, there is a stage when each color performs electrification, latent-image formation, and development simultaneously, and the processing time can be shortened compared with th exposure method of the part, the conventional many rotating types, or a tandem type.

[0044] In addition, with the gestalt of this operation, it considers as the flat bed type exposure section, EL pixel array 134 by the side of the inferior surface of tongue is allotted as the light source, and the live part of each color and the development section, the imprint section, and the fixing section are prepared in an upper surface side, and you may make it form a picture, moving the flat bed type exposure section to right and left by fixed speed, and a thin digital printer can be realized.

[0045]

[Effect of the Invention] it has the outstanding effect that the digital printer concerning this invention has unnecessary operation of horizontal scanning etc. as the light source in an internal image exposure method as explained above, the alignment of each color can be boiled markedly, and it can improve

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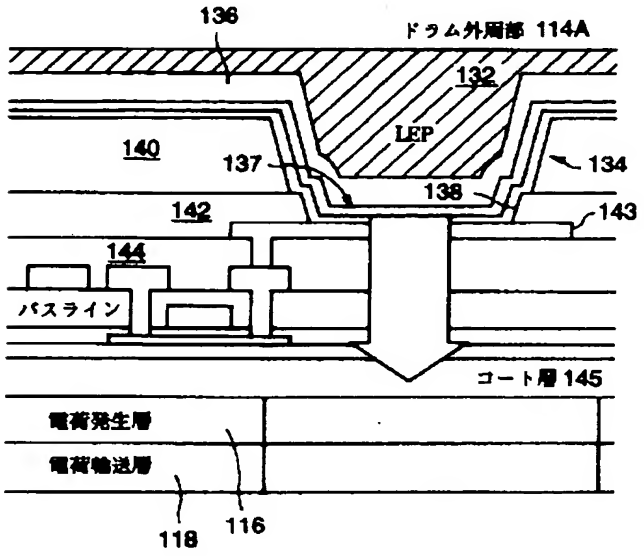
[Translation done.]

Drawing selection [Representativ drawing]



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JAPANESE [JP,2001-018441,A]

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[Translation done.]

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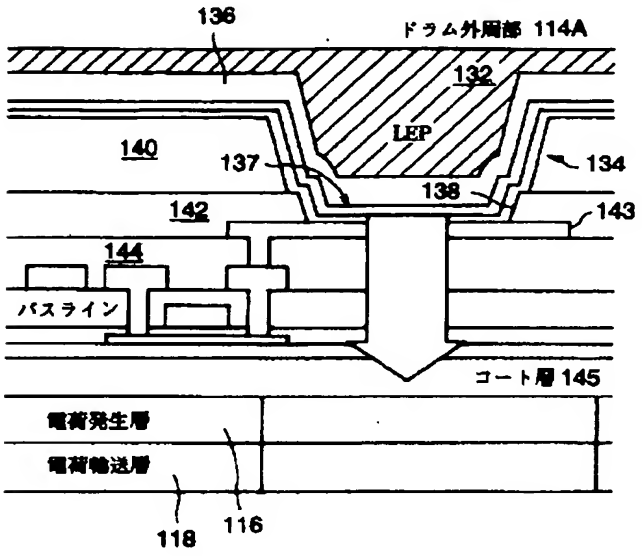

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PRIOR ART

[Description of the Prior Art] After repeating electrification, image exposure, and reversal development and piling up a direct color toner image on a photo conductor on a photo conductor in recent years, the color picture formation method which carries out a package imprint to imprint material is learned (KNC process).
[0003] This process feature is to perform subtractive color mixture which piles up a direct toner image on a photo conductor, and will develop negatives by forming the following latent image from on a toner image. It is possible to perform image exposure from the exterior and the interior of a photo conductor.
[0004] In order to form a color picture, the subtractive color color mixture which piles up a toner image is required. By the external image exposure method, since a toner image is already on a photo conductor, restrictions arise on image exposure wavelength.
[0005] On the other hand, by the method (internal image exposure) of performing image exposure of two amorous glance from the interior of a photo conductor, since it has the feature which can form a latent image, without being influenced by the toner layer on a photo conductor of optical cover, the grade of a color correction mitigates only amendment of toner layer potential sharply.
[0006] As a photo conductor of an internal image exposure method, standard usage considers as a drum configuration, and alignment and a Light Emitting Diode head with an easy miniaturization are more common than a laser beam study system as optical system. The diameter of a drum can carry out [minor diameter]-izing 30 to 40% compared with an external image exposure method. Moreover, in order to carry out image exposure from the interior of a drum by the Light Emitting Diode unit arranged inside a transparent drum, the superposition of alignment precision and a toner image improves.
[0007] Thus, by the internal image exposure method, alignment precision and a color pile can realize the small and high-speed color printer improved theoretically with combination with the Light Emitting Diode head which is small optical system.
[0008] Moreover, a one-revolution copy method has few dust of the toner image which poses a problem by the imprint method, and gaps, and it also has an advantage, like there are no restrictions of being suitable for whether it is high definition and a transfer paper.

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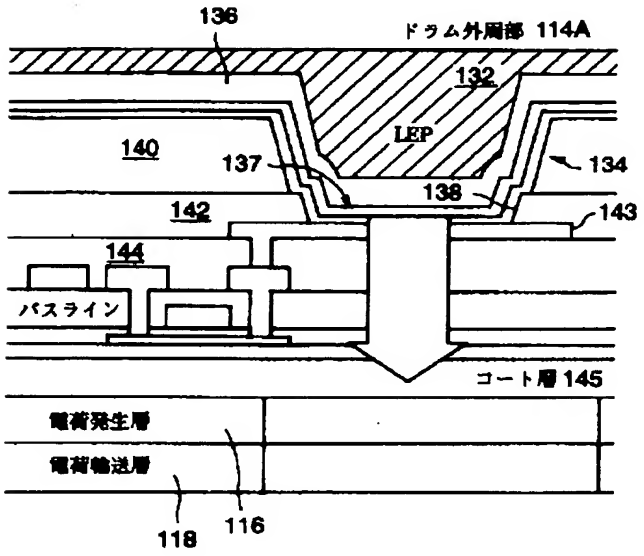

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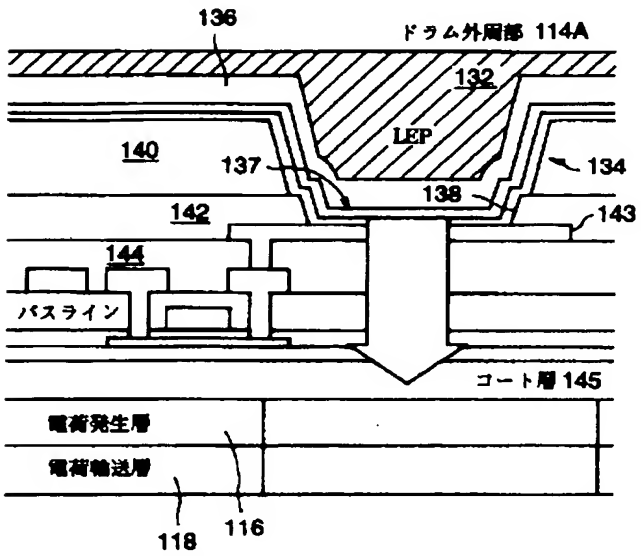

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TECHNICAL PROBLEM

[The technical problem for invention being solved] However, when a Light Emitting Diode unit is used as the light source, the light from a Light Emitting Diode unit is condensed, and it is necessary to perform horizontal scanning (shaft-orientations movement of a drum). Moreover, if compared with an external image exposure method, although alignment precision will be improved, the beginning timing of each color is dependent on the rotational-speed precision of a drum. Moreover, although there is also a method which uses a Light Emitting Diode unit as the line light source, and excludes horizontal scanning, the precision of the array of the Light Emitting Diode point light source is as low as about **50 micrometers, is still ruder, and unsuitable for a highly precise printer. [of a pitch]
[0010] it is the purpose to obtain the digital printer which operation of horizontal scanning etc. of this invention is [a digital printer] unnecessary as the light source in an internal image exposure method, it can boil the alignment of each color markedly in consideration of the above-mentioned fact, and can improve

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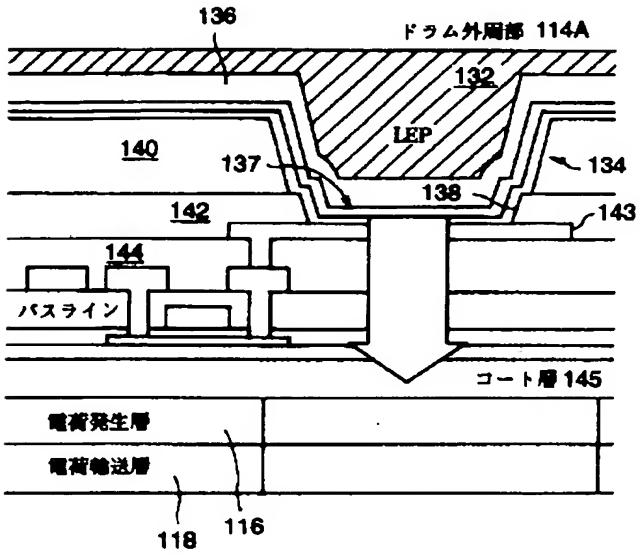

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MEANS

[Means for Solving the Problem] The conductive electrode layer which this invention put on one field of a fluorescent substance layer, the base layer formed from a charge control layer, and the aforementioned base layer, The circuit section which controls luminescence of a fluorescent substance by impressing predetermined voltage between the aforementioned electrode layers, And put on the field of another side of the aforementioned base layer, and the aforementioned base layer is divided. The TFT (Thin-Film-Transistor) layer which was made to produce the potential difference independently between the aforementioned electrode layers for every division field, and was equipped with two or more pixel sections which can luminescence control the fluorescent substance of the aforementioned base layer, It is the digital printer which applied EL (Electro-Luminescent) pixel array come out of and formed as the light source for latent-image exposure.

[0012] Moreover, the live part for the aforementioned digital printer being charged in the periphery of a photo conductor drum and the aforementioned photo conductor drum, It has the pressurization member pressed by the development section which develops the electrostatic latent image formed in the aforementioned live part, and the periphery of the aforementioned photoconductor drum with predetermined nip pressure. it is made to convey, pinching imprint material between the peripheries of the aforementioned photoconductor drum, and it comes out with the imprint section which imprints the picture developed in the development section, and the fixing section for being prepared in the imprint subordinate style side in the conveyance way of the aforementioned imprint material, and a transfer picture being established, and is constituted

[0013] In the above-mentioned digital printer, the aforementioned development section is prepared for every predetermined pitch for two or more colors of every. A live part is prepared in an upstream for two or more of these development sections of every, respectively. during 1 rotation of the aforementioned photoconductor drum Electrification for every color, picture exposure of the predetermined hoop-direction width-of-face unit corresponding to the aforementioned predetermined pitch, and development are repeated, and two or more color pictures pile up on the aforementioned photoconductor drum, and are imprinted the back to the aforementioned imprint material.

[0014] Since the pixel array used as the light source is prepared in the drum perimeter and its relative position of the position of each pixel and the position of a drum peripheral surface always corresponds, it is only management of the pixel arranged in the shape of a matrix, and the picture position of two or more colors does not shift.

[0015] Furthermore, since it is in a drum perimeter, it can respond to all exposure methods, such as field exposure, scanning exposure, and slit exposure. In addition, whenever it forms the picture of predetermined hoop-direction width of face at once and the development of one color is completed, it is made to form the picture corresponding to the following color for every picture of this predetermined width of face in this invention. Consequently, two or more colors

can be developed by drum 1 rotation, and the picture of two or more colors can put on drum lifting.

[0016] Since the piled-up picture is imprinted by imprint material, is fixed in the fixing section in the imprint section and is discharged, compared with the conventional many rotary systems and a tandem system, processing of one picture can be managed extremely in a short time.

[0017]

[Embodiments of the Invention] The internal image exposure formula digital printer 100 concerning the gestalt of this operation is shown in drawing 1 .

[0018] The upper part of casing 102 is made into the engine section 104, and each part article required for image formation is attached. Moreover, the medium tray 106 is formed in the lower part of casing 102. The web material 108 is held in the medium tray 106. The sheet equipment which sends out at a time one web material 108 by which the laminating was carried out from the best layer and which is not illustrated is arranged in the upper part of this medium tray 106. thereby -- a web material 108 --, a conveyance roller pair -- it is the structure which pinching conveyance is carried out and is sent into 110 and 112 to the engine section 102

[0019] The photoconductor drum 114 is arranged in the engine section 102. This photoconductor drum 114 rotates by fixed speed in the direction of a clockwise rotation of drawing 1 .

[0020] The charge generating layer 116 and the charge transporting bed 118 (refer to drawing 2 , both detailed after-mentioned) are formed in the peripheral surface of a photoconductor drum 114 in layers, and can store a charge in it (electrification).

[0021] Around this photoconductor drum 114, two or more live parts 120 and development sections 122 of every color (CMYK) are arranged. in addition, the turn of arrangement -- the direction of a clockwise rotation of a photoconductor drum 114 -- meeting -- live-part 120for Y colors Y, development section 122Y for Y colors, and the object for M colors -- live-part 120M, development section 122M for M colors, live-part 120for C colors C, development section 122C for C colors, and the object for K colors -- it is live-part 120K and development section 122K for K colors At each live part 120, the front face of a photoconductor drum 114 is charged in plus, and the toner charged in minus is supplied in the development section 122. That is, in the field between the live part 120 of each color, and the development section 122, the latent image of each color is formed in a photoconductor drum 114 with the internal light source 124 mentioned later.

[0022] Moreover, it is conveyed by the imprint section 126 prepared in the lower part of drawing 1 of a photoconductor drum 114, the aforementioned web material 108 progresses along with the tangential direction of a photoconductor drum 114, and it is conveyed, being pressed by the photoconductor drum 114 by the predetermined pressure in the imprint section 126. In addition, at the time of this press, the seal of approval of the predetermined plus voltage for drawing near the toner by which minus electrification was carried out is carried out.

[0023] After an imprint in the aforementioned imprint section 126 is completed, by continuing rotation and passing the cleaner section 128, a peripheral surface is cleaned and a photoconductor drum 114 returns to the electrification position of the aforementioned beginning.

[0024] That is, with the gestalt of this operation, the development of two or more colors required for a full color picture at one rotation of a photoconductor drum 114 and an imprint can be performed.

[0025] The web material 108 which passed the imprint section 126 is conveyed to the fixing section 130, fixes the toner imprinted by the heat of predetermined temperature, and the predetermined pressure, is discharged from the outside of casing 102, and is sent on the eccrisis tray 132.

[0026] Inside the charge generating layer 116 prepared in the peripheral surface of the aforementioned photoconductor drum 114, and the charge transporting bed 118, the

aforementioned field-like internal light source array 124 is formed so that these layers may be met.

(Structure of the internal light source) A part of cross-section structures of the periphery of a photoconductor drum 114 are shown in drawing 2 .

[0027] EL pixel array 134 as an internal light source array 124 is wound around periphery section 114A of the main part of a drum through the adhesives layer 132, and it is stuck on it.

[0028] As for EL pixel array 134, the cathode electrode layer 136 (product made from an aluminum lithium alloy), the fluorescent substance layer 137, the electron hole (hole) transporting bed 138 (the photogene layer 137 and the electron hole transporting bed 138 are called base layer.), the layer insulation film 140, the adhesives layer 142 (SiO2), the anode plate electrode layer 143, and the TFT layer 144 are formed one by one from the aforementioned adhesives layer 132 side. After EL pixel array is stuck on the main part of a drum, the coat layer 145 is formed in the front face, the charge generating layer 116 and the charge transporting bed 118 are formed one by one, and a photoconductor drum 114 is done.

[0029] It is divided into pixel section 144P and circuit section 144C, pixel section 144P are divided in the shape of a matrix, and the TFT layer 144 is the aggregate which is the pixel which can luminescence control a fluorescent substance independently, as shown in drawing 3 and drawing 5 . Moreover, circuit section 144C is a driver for performing luminescence control of this pixel, and is arranged ranging over two sides (X driver section 144CX and Y driver section 144CY) which the TFT layer 144 adjoins. In addition, X driver section 144CX in circuit section 144C of the TFT layer 144 makes the simultaneously perimeter of a drum the field which can be charged by considering as the superposition bottom when EL display object 134 winds (refer to drawing 3). in addition, the piled-up portion has acquired the smooth field without a level difference by devising the layer structure of a pile, although a circumference level difference arises usually coming out Although there is almost no gap, as for the part of this joint, it is desirable to make a joint line into a drum rotation initial valve position.

[0030] In pixel section 144P of the TFT layer 144, circuit 144A shown in drawing 4 is crowded.

[0031] It is the line by which the scanning line 146 transmits the signal from Y driver section 144CY, and is the line by which a signal line 148 transmits the signal from X driver section 144CX, and a desired pixel can be made to emit light with predetermined gradation in this circuit 144A by choosing Coordinate x and the pixel which emits light based on y. The capacitor line 150 is a means for giving the reference potential of a capacitor, and the potential from a signal line is stored in a capacitor 151.

[0032] Here, each circuit 144A on pixel section 144P is controlled by circuit section 144C of the TFT layer 144 to be shown in drawing 5 . That is, the transistor 152 for a switch is turned on, signal potential is stored in a capacitor 151 and it makes the transistor 154 for a drive turn on. Thus, the potential difference arises between the anode plate on drive TFT 154, and the cathode electrode layer 136, and it has the structure where the fluorescent substance layer 137 currently pinched by this portion emits light. The electron hole transporting bed 138 is a layer for making the hole from an anode plate easy to inject into the EL layer 137. In addition, with the gestalt of this operation, a coloring color is the light and gradation is expressed based on the voltage information from each signal line.

[0033] EL pixel array 134 in the gestalt of the above-mentioned implementation is formed through the process indicated by the upper shell turn of drawing 6 . The order of a process serves as stratum disjunctum formation ->TFT element formation -> layer insulation film formation -> contact hole formation -> transparent-electrode stratification -> bank formation -> hole transporting-bed formation ->EL stratification -> electrode stratification.

[0034] Stratum disjunctum is formed for example, by amorphous silicon:H, and by irradiating a laser beam, the portion exfoliates and it can remove EL pixel array from a pedestal. It is wound on the main part of a drum, and stripped-off EL pixel array 134 is stuck, as shown in drawing 3 . Then, the coat layer 145, the charge generating layer 116, and the charge transporting bed 118

are formed one by one, and become a photoconductor drum 114.

[0035] With the internal light source of the above-mentioned composition, since the pixel of the regular position exists to the peripheral surface of a photoconductor drum 114, respectively, a latent image can be formed in the state where there is no position gap of the picture of two or more colors.

[0036] When the aforementioned initial valve position of a photoconductor drum 114 passes the cleaner section 128, rotating a photoconductor drum 114 by fixed speed, the order of formation of a latent image It is charged by live-part 120Y for the first colors (Y color), and a latent image is formed with the light from the internal light source 124 based on the picture signal for Y colors. After developing negatives by development section 122Y, it is charged in live-part 120M for the following color (M color), and performs rewriting a latent image to all colors based on the picture signal for M colors. Namely, electrification and development of each color can be simultaneously advanced now in the middle of image formation.

[0037] An operation of the gestalt of this operation is explained below.

[0038] If there are print directions, first, a photoconductor drum 114 is rotated, and when an initial valve position 134, i.e., EL display object, is made to go around, the joint section of the edge which laps with X driver section 144CX will detect the stage which passed the cleaner section 128.

[0039] From this time, a clock is started and electrification of each color, latent-image formation (EL luminescence), and development (toner supply) are started in a timing ty second, tm second, tc second, and tk second. This timing ty second, tm second, tc second, and tk second are decided by the movement magnitude from the aforementioned initial valve position to the live part 120 of each color, and linear velocity of a photoconductor drum 114, and, in the case of pitches [live part / each / 120], each time interval difference alpha becomes equal. Namely, after passing an initial valve position, electrification of live-part 120y is started in ty second. Electrification of live-part 120M is started after fixed time alpha progress (since an initial valve position is passed after tm). Furthermore, electrification of live-part 120C is started after fixed time alpha progress (since an initial valve position is passed after tc second), and electrification of live-part 120K is further started after fixed time alpha progress (since an initial valve position is passed after tk second).

[0040] Synchronizing with the initial valve position of a photoconductor drum 114 passing the imprint section 126, a web material 108 is carried out from a medium tray 106, and a point enters to the imprint section 126. For this reason, the toner of each color piles up with the picture field of the photoconductor drum 114 which adhered in piles, and is pinched by the predetermined pressure. At this time, in the imprint section 126, the potential of plus has arisen and it is easy to imprint the toner charged in minus to a web material 108. Thereby, a toner is certainly imprinted by the web material 108.

[0041] A web material 108 is conveyed to the fixing section 130 of the following process, and after fixing processing is carried out, it is discharged to the eccrisis tray 132. Moreover, an initial valve position results to the cleaner section 128, and, as for the photo conductor drum 114, it waits for the next print directions.

[0042] Since according to the gestalt of this operation EL pixel array 134 was used as the interior light source 124 of attachment over the perimeter and the pixel controllable by the TFT layer 144 was assigned to all the image formation fields of a photoconductor drum 114 in accordance with the peripheral surface of a photoconductor drum 114, the mechanism moved to main scanning direction becomes unnecessary like the internal light source using the conventional Light Emitting Diode, and the element with which the picture position for every color shifts is completely lost. For this reason, in a full color picture, there is no color gap etc. and a high-definition picture can be acquired.

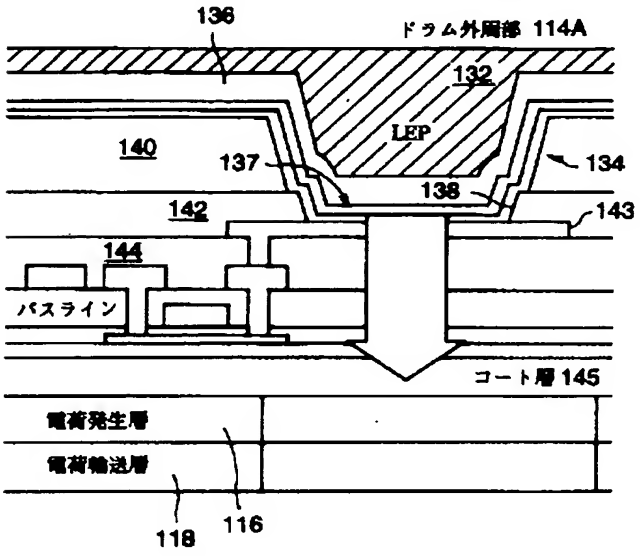
[0043] Moreover, according to the above-mentioned image formation control, there is a stage when each color performs electrification, latent-image formation, and development

simultaneously, and the processing time can be shortened compared with the exposure method of the part, the conventional many rotating types, or a tandem type.

[0044] In addition, with the gestalt of this operation, it considers as the flat bed type exposure section, EL pixel array 134 by the side of the inferior surface of tongue is allotted as the light source, and the live part of each color and the development section, the imprint section, and the fixing section are prepared in an upper surface side, and you may make it form a picture, moving the flat bed type exposure section to right and left by fixed speed, and a thin digital printer can be realized.

[Translation done.]

Drawing selection [Representativ drawing]



[Translation done.]

JAPANESE [JP,2001-018441,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

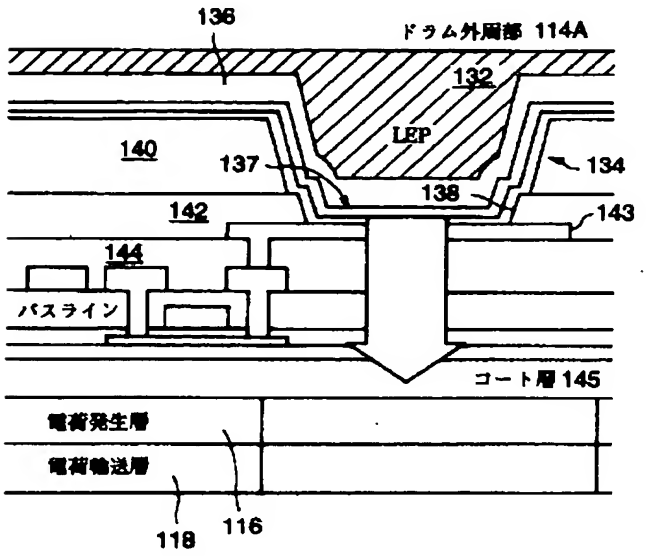
[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is outline structural drawing of the digital printer concerning the gestalt of this operation.
[Drawing 2] It is the cross section of the periphery section containing the internal light source prepared in the periphery of a drum.
[Drawing 3] The perspective diagram in which (A) shows the circumference state of a TFT layer, and (B) are the front view showing the circumference state of a TFT layer.
[Drawing 4] It is the circuit diagram formed in each pixel section of a TFT layer.
[Drawing 5] It is the development showing the arrangement state of the pixel of drum lifting, and a circuit diagram.
[Drawing 6] It is the manufacture process view of EL display object.
[Description of Notations]
100 Digital Printer
114 Photoconductor Drum
120 Live Part
122 Development Section
124 Internal Light Source
134 EL Display Object
144 TFT Layer
144P Pixel section
144C Circuit section
144CX(s) X driver section
144CY(s) Y driver section

[Translation done.]

Drawing selection [Repr s ntative drawing]



[Translation done.]

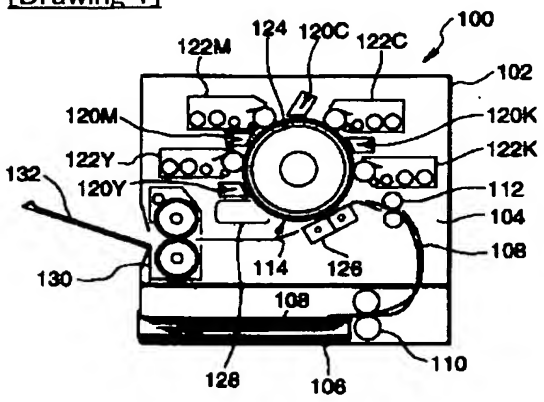
JAPANESE [JP,2001-018441,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

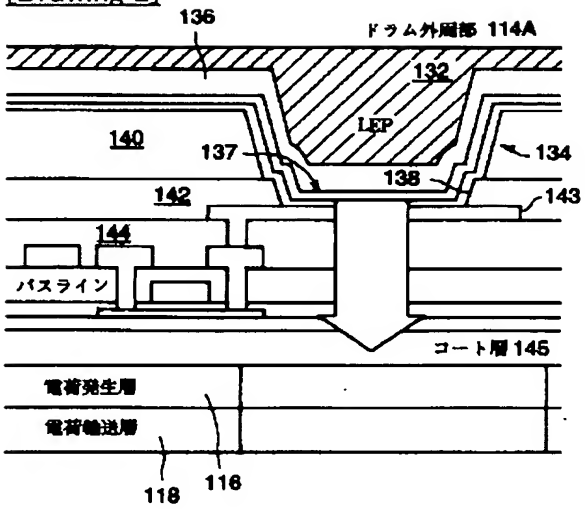
[Translation done.]

DRAWINGS

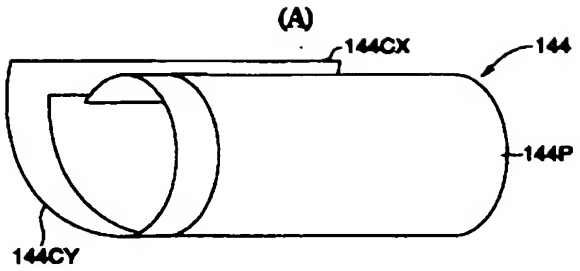
[Drawing 1]

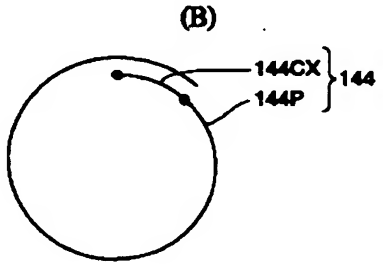


[Drawing 2]

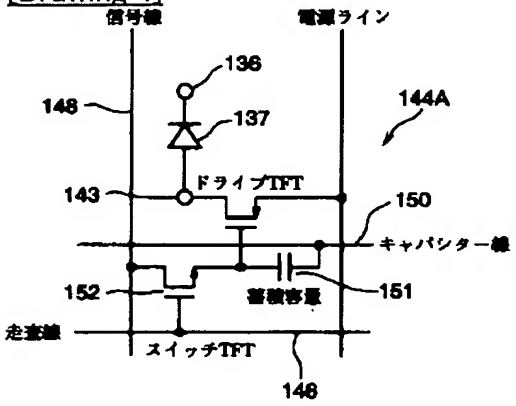


[Drawing 3]

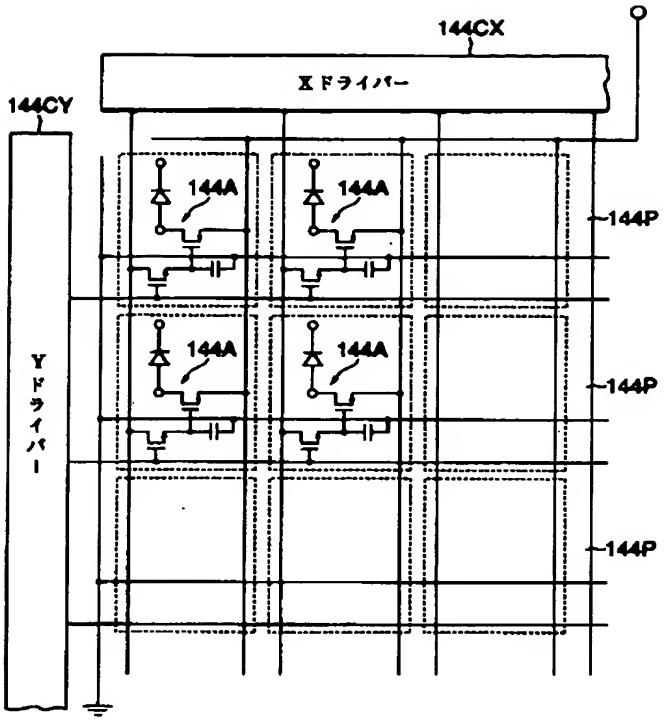




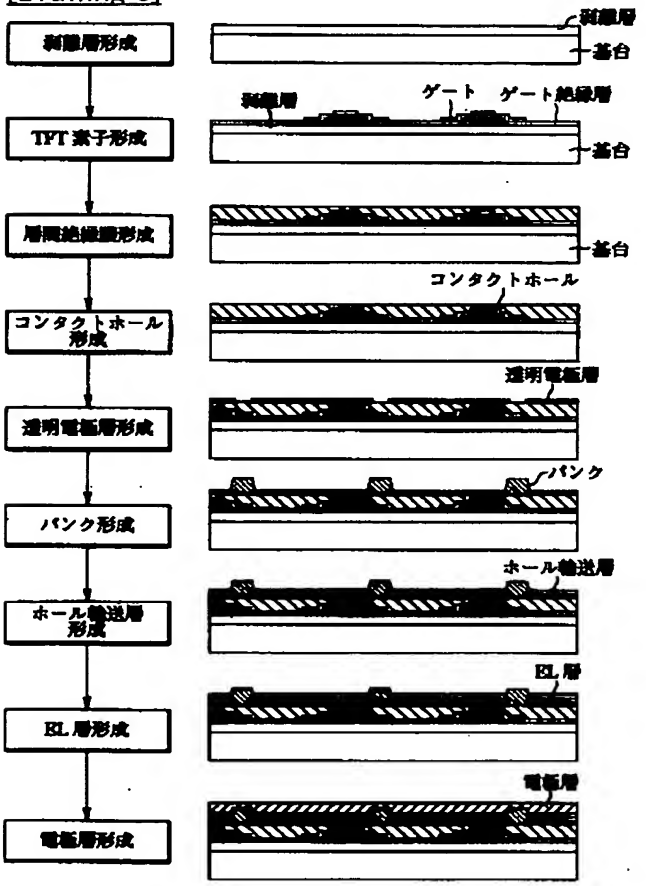
[Drawing 4]



[Drawing 5]

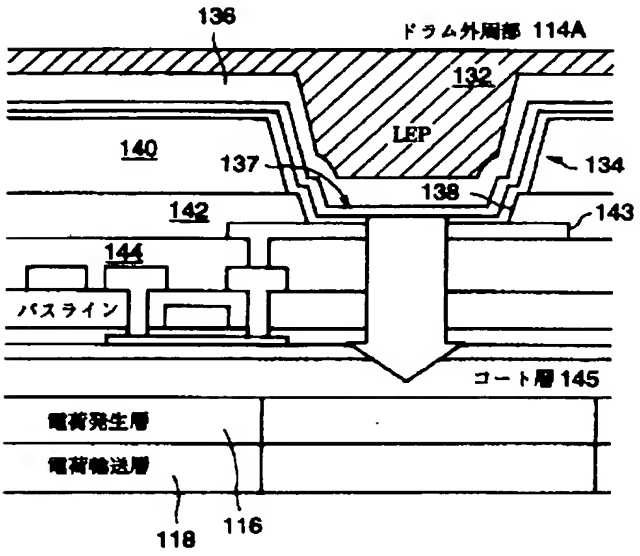


[Drawing 6]



[Translation done.]

Drawing selection [R pr sentative drawing]



[Translation done.]

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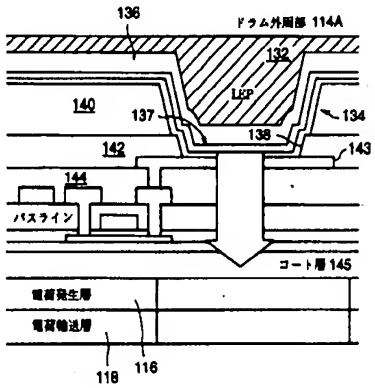
Ｆターム(参考)　2Ｃ162 AE12 AE21 AE28 AE37 FA16 FA23 FA50

(54)【発明の名称】　デジタルプリンタ

(57)【要約】
【課題】　内部像露光方式における光源として、主走査等の動作が不要であり、各色の位置合わせを格段に向上する。
【解決手段】　感光ドラム１１４の周面に沿って、ＥＬ画素アレイ１３４を全周にわたって貼り付け内部光源１２４とし、感光ドラム１１４の画像形成領域の全てに、ＴＦＴ層１４４で制御可能な画素を割り付けたため、従来のＬＥＤを用いた内部光源のように、主走査方向に移動させる機構が不要となり、各色毎の画像位置がずれる要素が全くなくなる。このため、フルカラー画像において、色ずれ等が全くなく、高画質の画像を得ることができる。



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【特許請求の範囲】
【請求項１】　蛍光物質層と電荷制御層とからなるベース層と、
前記ベース層の一方の面に重ね合わされた電極層と、
前記電極層との間に所定の電圧を印加することによって蛍光物質の発光を制御する回路部、及び前記ベース層の他方の面に重ね合わされて前記ベース層を分割し、分割領域毎に独立して前記電極層との間に電位差を生じさせ、前記ベース層中の蛍光物質を発光制御可能な複数の画素部を備えたＴＦＴ層と、で形成されたＥＬ画素アレイを潜像露光用光源として適用したデジタルプリンタ。
【請求項２】　前記請求項１に記載のデジタルプリンタが、感光体ドラムと、前記感光体ドラムの外周を帯電するための帯電部と、前記帯電部に形成された静電潜像を現像する現像部と、前記感光ドラムの外周に所定のニップ圧で押圧される加圧部材を備え、転写材を前記感光ドラムの外周との間で挟持しながら搬送させ、現像部で現像された画像を転写する転写部と、前記転写材の搬送路における転写部下流側に設けられ、転写画像を定着するための定着部と、で構成されていることを特徴とするデジタルプリンタ。
【請求項３】　前記現像部が複数の色毎に所定のピッチ毎に設けられ、この複数の現像部毎にそれぞれ上流側に帯電部が設けられ、前記感光ドラムの１回転中に、各色毎の帯電、前記所定のピッチに対応する所定の周方向幅単位の画像露光、及び現像が繰り返され、複数の色画像が前記感光ドラム上で重ね合わされた後、前記転写材へ転写される、ことを特徴とする請求項２記載のデジタルプリンタ。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、有機・無機ＥＬパネル等のＥＬ表示体を用いた電子プリンタに関する。
【０００２】
【従来の技術】近年、感光体上に、帯電、像露光、反転現像を繰り返して、直接カラートナー像を感光体上に重ね合わせた後、転写材へ一括転写するカラー画像形成方法が知られている（ＫＮＣプロセス）。
【０００３】このプロセスの特徴は、感光体上で直接トナー像を重ねあわせる減法混色を行うことにあり、トナー像の上から次の潜像を形成し、現像を行うことになる。像露光は、感光体の外部や内部から行うことが可能である。
【０００４】カラー画像を形成するには、トナー像を重ね合わせる減色混色が必要である。外部像露光方式では、既に感光体上にトナー像が有ることから、像露光波長に制約が生じる。
【０００５】これに対し、２色目の像露光を感光体の内部から行う方法（内部像露光）では、感光体上のトナー層の光遮蔽の影響を受けずに潜像を形成できる特徴を有

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することから、トナー層電位の補正のみでよく、色補正の程度は大幅に軽減する。
【０００６】内部像露光方式の感光体としては、ドラム形状とするのが標準的な使い方であり、光学系としてはレーザ光学系より、位置合わせや小型化が容易なＬＥＤヘッドが一般的である。ドラム径は、外部像露光方式と比べ３０～４０％小径化できる。また、透明ドラム内部に配置したＬＥＤユニットによりドラム内部からの像露光するため、位置合わせ精度とトナー像の重ね合わせが向上する。
【０００７】このように、内部像露光方式では、小型光学系であるＬＥＤヘッドとの組み合わせにより、位置合わせ精度と色重ねが原理的に改良された小型で高速のカラープリンタを実現できる。
【０００８】また、一回転写方式は、転写方式で問題となるトナー像のちりやずれが少なく、高画質かに通している事、転写紙の制約がないなどの利点も有している。
【０００９】
【発明が解決するための課題】しかしながら、ＬＥＤユニットを光源として用いた場合、ＬＥＤユニットからの光を集光し、主走査（ドラムの軸方向移動）を行う必要がある。また、外部像露光方式に比べれば、位置合わせ精度が改良されてはいるが、各色の書き出しタイミングが、ドラムの回転速度精度に依存する。また、ＬＥＤユニットをライン光源にして、主走査を省く方式もあるが、ＬＥＤ点光源の配列の精度は±５０μｍ程度と低く、さらにピッチも荒く、高精度のプリンタには不向きである。
【００１０】本発明は上記事実を考慮し、内部像露光方式における光源として、主走査等の動作が不要であり、各色の位置合わせを格段に向上することができるデジタルプリンタを得ることが目的である。
【００１１】
【課題を解決するための手段】本発明は、蛍光物質層と電荷制御層から形成されるベース層と、前記ベース層の一方の面に重ね合わされた導電性の電極層と、前記電極層との間に所定の電圧を印加することによって蛍光物質の発光を制御する回路部、及び前記ベース層の他方の面に重ね合わされて前記ベース層を分割し、分割領域毎に独立して前記電極層との間に電位差を生じさせ、前記ベース層の蛍光物質を発光制御可能な複数の画素部を備えたＴＦＴ（Thin-Film-Transistor）層と、で形成されたＥＬ（Electro-Luminescent）画素アレイを潜像露光用光源として適用したデジタルプリンタである。
【００１２】また、前記デジタルプリンタが、感光体ドラムと、前記感光体ドラムの外周を帯電するための帯電部と、前記帯電部に形成された静電潜像を現像する現像部と、前記感光ドラムの外周に所定のニップ圧で押圧される加圧部材を備え、転写材を前記感光ドラムの外周との間で挟持しながら搬送させ、現像部で現像された画像

を転写する転写部と、前記転写材の搬送路における転写部下流側に設けられ、転写画像を定着するための定着部と、で構成されている。

【００１３】上記デジタルプリンタにおいて、前記現像部が複数の色毎に所定のピッチ毎に設けられ、この複数の現像部毎にそれぞれ上流側に帯電部が設けられ、前記感光ドラムの１回転中に、各色毎の帯電、前記所定のピッチに対応する所定の周方向幅単位の画像露光、及び現像が繰り返され、複数の色画像が前記感光ドラム上で重ね合わされ後、前記転写材へ転写される。

【００１４】光源として用いられる画素アレイは、ドラム全周に設けられているため、各画素の位置とドラム周面の位置との相対位置が常に一致するため、マトリクス状に配列される画素の管理のみで、複数の色の画像位置がずれることはない。

【００１５】さらに、ドラム全周にあるため、面露光、走査露光、スリット露光等の全ての露光方式に対応することができる。なお、本発明では、所定の周方向幅の画像を一度に形成し、１つの色の現像が終了する毎に、この所定幅の画像毎に次の色に対応する画像を形成するようにしている。この結果、ドラム１回転で複数色の現像が行え、ドラム上に複数色の画像が重ねることができる。

【００１６】重ねられた画像は、転写部で転写材に転写され、定着部において定着させて排出するため、従来の多回転方式や、タンデム方式に比べて、１画像の処理が極めて短時間で済む。

【００１７】

【発明の実施の形態】図１には、本実施の形態に係る内部像露光式デジタルプリンタ１００が示されている。

【００１８】ケーシング１０２の上部はエンジン部１０４とされ、画像形成に必要な各部品が組み付けられている。また、ケーシング１０２の下部には、給紙トレイ１０６が設けられている。給紙トレイ１０６には、シート材１０８が収容されている。この給紙トレイ１０６の上部には、積層されたシート材１０８を最上層から１枚ずつ送り出す図示しない枚葉装置が配設されている。これにより、シート材１０８は、搬送ローラ対１１０、１１２に挟持搬送され、エンジン部１０２へ送り込まれる構造である。

【００１９】エンジン部１０２には、感光ドラム１１４が配設されている。この感光ドラム１１４は、図１の時計回り方向に定速で回転するようになっている。

【００２０】感光ドラム１１４の周面には、電荷発生層１１６及び電荷輸送層１１８（図２参照、共に詳細後述）が層状に設けられており、電荷を蓄えることができる（帯電）。

【００２１】この感光ドラム１１４の周囲には、複数の色（CMYK）毎の帯電部１２０と、現像部１２２が配設されている。なお、配置の順番は、感光ドラム１１４

の時計回り方向に沿って、Y色用帯電部１２０Y、Y色用の現像部１２２Y、M色用帯電部１２０M、M色用の現像部１２２M、C色用帯電部１２０C、C色用の現像部１２２C、K色用帯電部１２０K、K色用の現像部１２２Kとなっている。各帯電部１２０では、感光ドラム１１４の表面をプラスに帯電し、現像部１２２では、マイナスに帯電されたトナーを供給するようになっている。すなわち、感光ドラム１１４には、各色の帯電部１２０と現像部１２２との間の領域において、後述する内部光源１２４によって各色の潜像が形成されるようになっている。

【００２２】また、前記シート材１０８は、感光ドラム１１４の図１の下部に設けられた転写部１２６に搬送され、感光ドラム１１４の接線方向に沿って進み、転写部１２６において所定の圧力で感光ドラム１１４に押圧されながら搬送されるようになっている。なお、この押圧時には、マイナス帯電されたトナーを引き寄せるための所定のプラス電圧が印可されている。

【００２３】前記転写部１２６での転写が終了すると、感光ドラム１１４は、回転を継続し、クリーナー部１２８を通過することによって、周面がクリーニングされ、前記最初の帯電位置に戻るようになっている。

【００２４】すなわち、本実施の形態では、感光ドラム１１４の１回転でフルカラー画像に必要な複数の色の現像、転写を行うことができる。

【００２５】転写部１２６を通過したシート材１０８は、定着部１３０へと搬送され、所定温度の熱と、所定の圧力で転写されたトナーを定着させ、ケーシング１０２外から排出され、排出トレー１３２上に送られる。

【００２６】前記感光ドラム１１４の周面に設けられた電荷発生層１１６及び電荷輸送層１１８の内側には、これらの層に沿うように、面状の前記内部光源アレイ１２４が設けられている。

（内部光源の構造）図２には、感光ドラム１１４の外周の一部の断面構造が示されている。

【００２７】ドラム本体の外周部１１４Aには、接着剤層１３２を介して内部光源アレイ１２４としてのＥＬ画素アレイ１３４が巻回されて貼り付けられている。

【００２８】ＥＬ画素アレイ１３４は、前記接着剤層１３２側から陰極電極層１３６（アルミニウムリチウム合金製）、蛍光物質層１３７、正孔（ホール）輸送層１３８（発光物質層１３７と正孔輸送層１３８をベース層と呼ぶ。）、層間絶縁膜１４０、接着剤層１４２（SiO_2）、陽極電極層１４３、ＴＦＴ層１４４が順次設けられている。ドラム本体にＥＬ画素アレイが貼り付けられた後、その表面にコート層１４５が形成され、電荷発生層１１６、電荷輸送層１１８が順次形成されて感光ドラム１１４が出来上がる。

【００２９】ＴＦＴ層１４４は、図３及び図５に示すように、画素部１４４Pと回路部１４４Cとに分けられて

おり、画素部１４４Pは、マトリクス状に分割され、独立して蛍光物質の発光制御が可能な画素の集合体である。また、回路部１４４Cは、この画素の発光制御を行うためのドライバであり、ＴＦＴ層１４４の隣り合う２辺（Xドライバ部１４４CX及びYドライバ部１４４CY）に跨がって配設されている。なお、ＴＦＴ層１４４の回路部１４４CにおけるXドライバ部１４４CXはＥＬ表示体１３４の巻回したときの重ね合わせ下側とすることにより、ドラムのほぼ全周を帯電可能領域としている（図３参照）。なお、重ね合わせた部分は、通常であると周回段差が生ずるが、重ねの層構造を工夫することにより、段差のないスムーズな面を得ている。この継ぎ目の箇所は、殆どギャップはないが、継ぎ目線をドラム回転初期位置とすることが好ましい。

【００３０】ＴＦＴ層１４４の画素部１４４Pには、図４に示す回路１４４Aが込み込まれている。

【００３１】この回路１４４Aにおいて、走査線１４６がYドライバ部１４４CYからの信号を伝達する線であり、信号線１４８がXドライバ部１４４CXからの信号を伝達する線であり、座標x，yに基づいて発光する画素を選択することによって、所望の画素を所定の階調で発光させることができる。キャパシター線１５０は、キャパシターの基準電位を与えるための手段であり、信号線からの電位がキャパシータ１５１に蓄えられる。

【００３２】ここで、図５に示される如く、ＴＦＴ層１４４の回路部１４４Cで、画素部１４４P上の各回路１４４Aが制御される。すなわち、スイッチ用トランジスタ１５２がオンされ、キャパシター１５１に信号電位が蓄えられ、それがドライブ用トランジスタ１５４をオンさせる。このようにして、ドライブＴＦＴ１５４上の陽極と陰極電極層１３６との間に電位差が生じ、この部分に挟持されている蛍光物質層１３７が発光する構造となっている。正孔輸送層１３８は、陽極からのホールをＥＬ層１３７に注入し易くするための層である。なお、本実施の形態では、発色色は可視光であり、それぞれの信号線からの電圧情報に基づいて階調が表現されるようになっている。

【００３３】上記実施の形態における、ＥＬ画素アレイ１３４は、図６の上から順番に記載されている工程を経て形成される。工程順は、剥離層形成→ＴＦＴ素子形成→層間絶縁膜形成→コンタクトホール形成→透明電極層形成→パンク形成→ホール輸送層形成→ＥＬ層形成→電極層形成となっている。

【００３４】剥離層は例えば、アモルファスＳｉ：Hで形成され、レーザ光を照射することで、その部分が剥離してＥＬ画素アレイを基台から剥がすことができる。剥ぎ取ったＥＬ画素アレイ１３４は図３に示されるようにドラム本体上に巻回されて貼り付けられる。その後、コート層１４５、電荷発生層１１６、電荷輸送層１１８が順次形成され、感光ドラム１１４になる。

【００３５】上記構成の内部光源では、感光ドラム１１４の周面に対して、それぞれ定位置の画素が存在するため、複数色の画像の位置ずれが全くない状態で潜像を形成することができる。

【００３６】潜像の形成の順は、感光ドラム１１４を定速で回転しながら、感光ドラム１１４の前記初期位置がクリーナー部１２８を通過した時点で、最初の色（Y色）用の帯電部１２０Yによって帯電していき、Y色用画像信号に基づいて内部光源１２４からの光で潜像を形成し、現像部１２２Yによって現像した後、次の色（M色）のために帯電部１２０Mで帯電し、M色用画像信号に基づいて、潜像を書き換えていくことを、全ての色に対して行う。すなわち、画像形成途中において、各色の帯電と現像とを同時に進行させることができるようになっている。

【００３７】以下に本実施の形態の作用を説明する。

【００３８】プリント指示があると、まず、感光ドラム１１４を回転させ、初期位置、すなわちＥＬ表示体１３４を周回させたときにXドライバ部１４４CXと重なる端部の継ぎ目部がクリーナー部１２８を通過した時期を検出する。

【００３９】この時点から、クロックをスタートさせ、タイミングｔｙ秒、ｔｍ秒、ｔｃ秒、ｔｋ秒後にそれぞれの色の帯電、潜像形成（ＥＬ発光）、現像（トナー供給）を開始する。このタイミングｔｙ秒、ｔｍ秒、ｔｃ秒、ｔｋ秒は、前記初期位置から各色の帯電部１２０までの移動量と、感光ドラム１１４の線速度によって決まるものであり、各帯電部１２０が等ピッチの場合は、各時間間隔差αは等しくなる。すなわち、初期位置を通過してからｔｙ秒後に帯電部１２０ｙの帯電を開始し、一定時間α経過後（初期位置を通過してからｔｍ後）に帯電部１２０Mの帯電を開始し、さらに一定時間α経過後（初期位置を通過してからｔｃ秒後）に帯電部１２０Cの帯電を開始し、さらに一定時間α経過後（初期位置を通過してからｔｋ秒後）に帯電部１２０Kの帯電を開始する。

【００４０】感光ドラム１１４の初期位置が転写部１２６を通過するのと同期して、シート材１０８が給紙トレイ１０６から持ち出され、先端部が転写部１２６へ入り込む。このため、各色のトナーが重ねて付着した感光ドラム１１４の画像領域と重ね合わされ、所定の圧力で挟持される。このとき、転写部１２６では、プラスの電位が生じており、マイナスに帯電されたトナーがシート材１０８に転写し易くなっている。これにより、確実にトナーがシート材１０８に転写される。

【００４１】シート材１０８は、次工程の定着部１３０へと搬送され、定着処理された後、排出トレイ１３２へ排出される。また、感光体ドラム１１４は、初期位置がクリーナー部１２８へと至り、次のプリント指示を待つ。

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【００４２】本実施の形態によれば、感光ドラム１１４の周面に沿って、ＥＬ画素アレイ１３４を全周にわたって貼り付け内部光源１２４とし、感光ドラム１１４の画像形成領域の全てに、ＴＦＴ層１４４で制御可能な画素を割り付けたため、従来のＬＥＤを用いた内部光源のように、主走査方向に移動させる機構が不要となり、各色毎の画像位置がずれる要素が全くなくなる。このため、フルカラー画像において、色ずれ等が全くなく、高画質の画像を得ることができる。

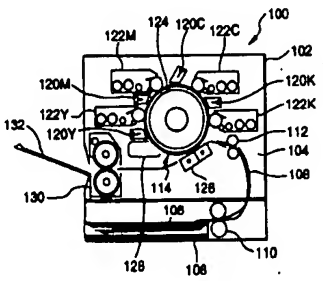
【００４３】また、上記画像形成制御によれば、各色が同時に帯電、潜像形成、現像を行う時期があり、その分、従来の多回転式やタンデム式の露光方式に比べ、処理時間を短縮することができる。

【００４４】なお、本実施の形態では、フラットベット型の露光部とし、その下面側のＥＬ画素アレイ１３４を光源として配し、上面側に各色の帯電部及び現像部、転写部、定着部を設け、フラットベット型の露光部を左右に定速で移動させながら画像を形成するようにしてもよく、薄型のデジタルプリンタを実現することができる。

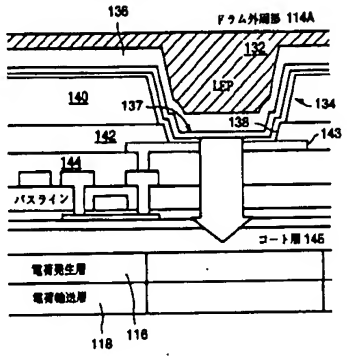
【００４５】

【発明の効果】以上説明した如く本発明に係るデジタルプリンタは、内部像露光方式における光源として、主走査等の動作が不要であり、各色の位置合わせを格段に向上することができるという優れた効果を有する。

【図１】



【図２】



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【図面の簡単な説明】

【図１】本実施の形態に係るデジタルプリンタの概略構造図である。

【図２】ドラムの外周に設けられた内部光源を含む外周部の断面図である。

【図３】（Ａ）はＴＦＴ層の周回状態を示す斜視図、（Ｂ）はＴＦＴ層の周回状態を示す正面図である。

【図４】ＴＦＴ層の各画素部に設けられた回路図である。

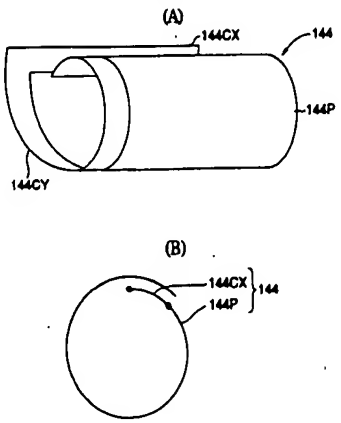
【図５】ドラム上の画素と回路図との配置状態を示す展開図である。

【図６】ＥＬ表示体の製造プロセス図である。

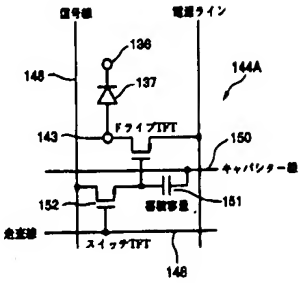
【符号の説明】

１００　デジタルプリンタ
１１４　感光ドラム
１２０　帯電部
１２２　現像部
１２４　内部光源
１３４　ＥＬ表示体
１４４　ＴＦＴ層
１４４Ｐ　画素部
１４４Ｃ　回路部
１４４ＣＸ　Ｘドライバ部
１４４ＣＹ　Ｙドライバ部

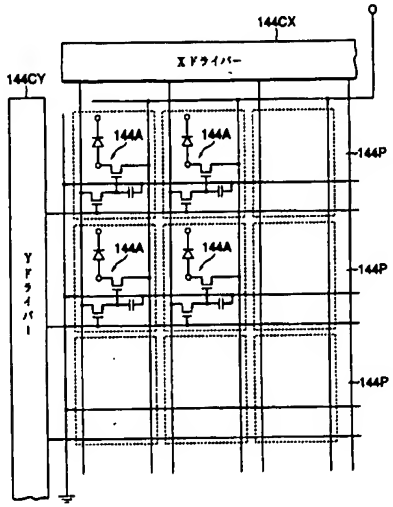
【図３】



【図４】



【図５】



【図６】